

**494. Systems of Agricultural Machines**  
Fall. 4(3-2) 353.

Systems of machines used in field and farmstead operations. Engineering principles for machines dealing with biological materials.

**804. Agricultural Mechanization in Developing Countries**

Spring. 3(3-0) Approval of department.

Principles of mechanical equipment selection for organized agricultural enterprises. Machinery specifications and standards, performance efficiency, cost and use, and management factors. Domestic and foreign considerations.

**805. Environmental Measurements**

Fall. 3(2-2)

Methods and techniques for accurate measurement and interpretation of environmental parameters. Temperature, humidity, wind and air flow characteristics, radiation, light intensity, gaseous and particulate concentrations in atmospheric microclimates will be discussed.

**811. Technical Problems**

Fall, Winter, Spring, Summer. 1 to 4 credits. May re-enroll for a maximum of 9 credits.

**812. Bio-Processing Engineering**

Winter. 3(3-0) Approval of department.

Topics will be presented pertaining to thermodynamics, heat and mass transfer, thermal processing, fluid flow, dehydration and freeze drying of biological products or biological processes.

**814. Physical Properties of Agricultural Products**

Winter. 3(3-0) Approval of department.

Physical and mechanical behavior of fruits and vegetables, forages, grains and other agricultural products under constant and dynamic loading. Related to design parameters for production, handling and processing machinery.

**815. Instrumentation for Agricultural Engineering Research**

Fall. 3(3-0)

Theory, method and techniques of measuring temperature, pressure, flow, humidity, and moisture for biological materials. Associated recording and indicating equipment.

**820. Research Methods in Agricultural Engineering**

Fall. 1(1-0)

Discussion of procedures for initiating, developing, carrying out, and completing research projects.

**822. Seminar**

Spring. 1(1-0)

**840. Advanced Power and Machinery**

Spring. 3(2-2) 493, 494.

Analysis of agricultural machine components and systems. Emphasis on hydraulic power transmission, controls, and management of machinery systems.

**899. Research**

Fall, Winter, Spring, Summer. Variable credit. Approval of department.

**990. Advanced Topics in Agricultural Engineering**

Fall, Winter, Spring. 3(3-0) May re-enroll for a maximum of 9 credits. Approval of department.

New developments in agricultural engineering. Subjects to be covered include atmospheric turbulence, optimization of agricultural systems, measurement systems, food engineering, and agricultural rheology.

**999. Research**

Fall, Winter, Spring, Summer. Variable credit. Approval of department.

**AGRICULTURE**

**AG**

**College of Agriculture and Natural Resources**

**401. Agriculture and Natural Resources Communications**

Winter, Spring. 3(2-2) JRN 201 or other writing course and approval of department.

Techniques, strategies and practices in development of agricultural and natural resources information programs. Including writing, public relations, TV and radio production for specialized and general audiences.

**402. Agriculture and Natural Resources Communications Internship**

Fall, Winter, Spring, Summer. 1 to 6 credits. May re-enroll for a maximum of 6 credits. 401, approval of college.

Internship with professionals in communications field with emphasis on student's areas of interest—writing, radio, TV, publications, etc.

**450. United States Agriculture for Overseas Students**

Fall. 3(3-0) Advanced undergraduate or graduate students from countries other than the United States or Canada.

Orientation course for overseas students. Development of United States agriculture. Institutions serving agriculture with emphasis on Land Grant University system. Scientific developments and their impact on agriculture. Field trips.

**462. Rural Transformation in Developing Societies**

Fall. 3(3-0) PAM 201 or EC 201; PAM 260 recommended. Interdepartmental with Public Affairs Management and Food Systems Economics and Management.

Traditional agricultural systems and the incentive environment for economic growth in rural areas. Adjustment to technological, institutional and human change. Strategies for rapid agricultural transformation.

**475. International Studies in Agriculture and Natural Resources**

Summer. 3 to 9 credits. Approval of the college. Interdepartmental with Natural Resources.

Study-travel experience emphasizing contemporary problems affecting agriculture in the world, national, and local communities. Field trips, case studies, interviews with leading experts, government officials, community leaders. Supervised individual study.

**488. The Impact of Animal Resource Management Upon the World's Developing Nations**

Winter. 3(4-0)

For course description, see Interdisciplinary Courses.

**865. Rural Development Administration I**

(802.) Winter. 3(2-2) Approval of department. Interdepartmental with and administered by the Department of Agricultural Economics.

Administrative concepts and their application in the analysis of the processes and structures through which agricultural and rural development activities are formulated and implemented in less developed countries.

**866. Rural Development Administration II**

(803.) Spring. 3(3-0) 865. Interdepartmental with and administered by the Department of Agricultural Economics.

Comparative analysis of major cases of intensive, purposeful change in less developed countries with emphasis on economic, administrative, political and other relevant factors which help explain program or policy effectiveness.

**880. Soils and Land Use in Tropical and Subtropical Regions**

Spring. 3(3-0) Approval of department. Interdepartmental with and administered by Soil Sciences.

Problem oriented studies of soils and land use in the tropics and subtropics in relation to their genesis, morphology, taxonomy, and management.

**AMERICAN STUDIES**

**AMS**

**College of Arts and Letters**

**301. Issues in American Civilization**

Fall, Winter, Spring. 3(3-0) May re-enroll for a maximum of 9 credits. ATL 113. Not applicable to major requirements.

Selected issues in American life past and present, with materials drawn from such disciplines as history, social sciences, philosophy, literature and the arts. Topics vary.

**410. Perspectives in American Studies**

Fall. 3 credits. Juniors in American Studies or approval of American Studies Committee.

Methods and significant works, for majors in the American Studies program. Offered by members of the relevant departments.

**411. Problems in American Civilization**

Winter, Spring. 3 credits. Majors must re-enroll for a maximum of 6 credits. 410, Juniors in American Studies or approval of American Studies Committee.

Seminar approach to selected problems in American life employing the objectives and approaches of interdisciplinary studies. Offered by members of relevant departments, for majors in the American Studies program.

**AMERICAN THOUGHT AND LANGUAGE**

**ATL**

**University College**

Alternative approaches or tracks are offered on an optional basis all of which meet the course objectives of 111, 112, 113. These are described briefly below and are designated by letters which are used as part of the course number for registration. No student may receive credit for more than one track within a course (111, 112, 113).

**101A. Comprehensive English**

(I S 095; 100.) Fall, Winter, Spring, Summer. 3(4-0) No student may receive credit in both 101A and 101B. Admission by examination or approval of department.

Instruction and practice in reading and writing. Emphasis upon mastery of fundamental skills needed for a variety of reading and writing assignments.